POLICY RESEARCH WORKING PAPER

2640

Where Has All the Foreign Investment Gone in Russia?

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Not only does Russia have a poor record of attracting foreign direct investment (FDI) since the advent of reform in the early 1990s, but well over half of the investment it does attract goes to four regions in the western part of the country. Overcoming this skewed distribution of FDI—undoubtedly a factor in the country's uneven regional economic development—is essential for furthering Russia's growth and transition to a market economy. Factors associated with market size, infrastructure development, and the policy environment seem to explain much of the observed variation in FDI flows to regions in Russia.

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Summary findings

Since its transition to a market economy began, Russia has not attracted much foreign direct investment (FDI). Inflows of FDI into Russia are much lower than those into other transition countries in the region, adjusted for population size and similar measures. Clearly, if Russia is to grow it must increase the *level* of FDI inflows, which is why a good deal of policy attention has focused on the problem.

Equally important for achieving sustainable growth in such a large, heterogeneous economy is learning how to make the *spatial distribution* of FDI *within* Russia more even. Inflows are strikingly skewed. Close to 60 percent of FDI goes to four regions in the western part of the country—Moscow City, Moscow oblast, St. Petersburg, and Leningrad oblast—which account for only 22 percent of Russia's gross national product and only 13 percent of Russia's population. Only two of the other 85 regions account for more than 2.5 percent of the country's FDI and most account for much less.

Surprisingly, neither policymakers nor observers and analysts have paid much attention to diagnosing the reason for this imbalance in FDI's distribution. Broadman and Recanatini try to empirically unbundle the determinants of FDI's regional distribution within Russia. They find that factors associated with market size, infrastructure development, and the policy environment seem to explain much of the observed variation in FDI flows to regions in Russia.

Moreover, the explanatory power of the model that best explains cross-regional variation in FDI flows from 1995 to 1998 changes significantly after the 1998 default and ruble devaluation—suggesting the possibility of a "structural change" in the determinants of FDI after the 1998 crisis.

This paper—a product of the Poverty Reduction and Economic Management Sector Unit, Europe and Central Asia Region—is part of a larger effort in the region to study structural reforms in the Russian Federation. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Sandra Craig, room H4-166, telephone 202-473-3160, fax 202-522-2753, email address scraig@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at hbroadman@worldbank.org or frecanatini@worldbank.org. July 2001. (29 pages)

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I. Introduction

Foreign direct investment (FDI) is an important engine of growth. In today's globalized economy, virtually all countries—and especially developing and transition countries—are increasingly vying with each other for greater amounts of FDI inflows. FDI provides a package of financial capital, technology, managerial skills, information, and goods and services that can make an economy more competitive in the world marketplace, promoting growth and reducing poverty.[1]

Russia's poor record for attracting FDI since the advent of its reform in the early 1990s is well known. Despite the country's large endowment of rich natural resources, highly educated labor force, and potentially large market, Russia has received relatively small amounts of FDI. At the start of 2000, cumulative net FDI inflows to Russia totaled about US$ 11 billion.[2] This level of FDI is very low relative to other transition countries in the region, adjusted for population size (or similar normalizing measures). On a per capita basis, cumulative net FDI inflows to Russia from 1992-99 are US$ 71, compared to US$ 511 for Poland, US$ 1493 for the Czech Republic and US$ 1581 for Hungary.[3] Clearly one key growth challenge for Russia's authorities is to improve the country's investment environment to increase the *level* of FDI inflows, and thus much policy attention has been focused on this problem.[4]

Equally important for Russia in terms of achieving sustainable growth is how to ensure a more even *spatial distribution* of FDI *within* the country. FDI inflows to Russia are strikingly skewed. Four regions[5]—Moscow City, Moscow oblast, St. Petersburg, and Leningrad oblast—account for substantially more than half of total inflows of FDI.[6] Moreover, all these regions are relatively close together in the western part of the country. Few of Russia's remaining 85 regions are recipients of FDI to any significant degree. While other large, heterogeneous transition economies—notably China[7]—exhibit uneven patterns of FDI, the skewed geographical distribution of Russia's FDI is quite pronounced. The benefits of FDI so unevenly dispersed may well not contribute effectively to a regional pattern of investment and industrial development that would engendered enduring growth. Indeed, it is arguable that the unevenness in the distribution of FDI to date is contributing to the skewed pattern of the country's regional economic development as well as other discrepancies between the regions. These problems

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[1] See, among others, UNCTAD (1999), Stern (2000), World Bank (2001). JP Morgan (1998) estimates that among transition economies, a 1.0 percentage point increase in FDI (measured as a proportion of GDP), increases per capita income by 0.8 percent.

[2] Foreign capital flows to and from Russia are monitored by both Goskomstat (the State Committee for Statistics) and the Central Bank of Russia (CBR). Goskomstat relies on customs statistics and special questionnaires. CBR takes into account Goskomstat data but also uses its own system for monitoring capital operations of banks. Therefore the data of the two agencies may differ but generally are of the same magnitude. Except where noted, in our analysis we rely on Goskomstat data.

[3] For these cross-country comparisons we relied on the data in the EBRD's most recent *Transition* report (EBRD, 2000).

[4] For a discussion of the policy issues see Bergsman, Broadman and Drebenstov (1999) and OECD (2001).

[5] In this paper we use the term "region" to cover the 89 *oblasts, krais*, republics, Federal-level cities and other jurisdictions that define the commonly known "subjects of the Russian Federation".

[6] See Tables 5 and 6.

[7] See Broadman and Sun (1997).

present the Russian authorities with challenges to overcome if FDI is to help sustain Russia's growth and further its transition to a market economy.

Surprisingly, assessing empirically why there is such an uneven pattern of FDI among Russia's regions has received relatively little attention—either from policy makers or analysts.[8] This paper, using the region as the unit of analysis, attempts to shed light on this issue. We develop a set of hypotheses about the determinants of the distribution of FDI within Russia (although they are generally applicable to most countries), and test them using data for the period 1994-1999. Our hypotheses center on the notion that regions differ not only in terms of economic dimensions, infrastructure development and geography, but also with respect to policy, institutional, and political elements. We believe a focus on these latter factors is especially important in transition economies insofar as—especially at the regional level—basic market institutions are still nascent and political economy problems are rife, and that there are pronounced differences among regions along both of these dimensions.

The paper is structured as follows. Section II presents an overview of the recent trend in the flow and stock of FDI in Russia, placing it in the worldwide, national and regional contexts. Section III reviews existing theories of determinants of FDI, outlines our hypotheses, and describes the data and the variables we employ. The empirical results of the econometric tests of our hypotheses are discussed in Section IV. Section V summarizes the main findings and suggestions for extensions of our research.

II. Trends and Distribution of FDI for Russia

World and Regional Trends and Distribution of FDI[9]

Gross *inflows* of FDI on a global basis greatly increased in the 1990s relative to the previous decade. As shown in Table 1, developed countries continue to be the largest recipients of FDI; they also experienced a greater rate of increase in inflows relative to developing and transition countries. The share of total developing and transition country FDI inflows accounted for by CEE and CIS countries increased from an annual average of 7 percent during 1985-95 to 10 percent in 1999. Of this total, Russia's shares of inflows of FDI rose only slightly, from just under an annual average of 1 percent during 1985-95 to just over 1 percent in 1999. 1997 marked the greatest annual gross inflows of FDI to Russia to date—US$ 6 billion.

Data on gross *outflows* of FDI are presented in Table 2. Not surprisingly, developed economies are the largest source countries for FDI, with their share increasing over the decade. The CEE and CIS countries as a whole increased their share in gross outflows of FDI among developing and transition

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[8] Bradshaw (1995) contains an early comprehensive description of the spatial distribution of FDI within Russia, but does not attempt to explain statistically the observed patterns. Ahrend (1999) focuses on differentials in growth performance across the regions, using the level of FDI in each region as an explanatory variable. A recent Master thesis by Manankov (2000) focuses on many of the same issues as we do; however, while we analyze the differentials in flows of FDI to a region, he analyzes the number of foreign joint ventures established in each region.

[9] For the analysis of world and regional data on FDI flows and stocks we use UNCTAD (2000) data, which are the most up-to-date and comprehensive data currently available for this purpose. UNCTAD relies on data from the CBR and its own staff estimates.

economies since the mid-1980s. Reflective of the well-known problem of capital flight, Russia's outflows of FDI account for a large portion of CEE and CIS outflows.

Table 1: Global Gross FDI Flows: Inward
(billions of dollars and percentages)

	1985-95 annual average	1996	1997	1998	1999
World	182.6 (100%)	377.5	473.1	680.1	865.5 (100%)
Developed Countries	129.3 (71%)	219.8	275.2	480.6	636.4 (73%)
Developing & Transition Countries	50.1 (27%)	145.0	178.8	179.5	207.6 (24%)
CEE and CIS	3.6 (7.0%)*	15.2	22.1	23.1	24.2 (10%)*
Russia	*0.4 (0.8%)**	*2.5*	*6.6*	*2.8*	*2.9 (1.4%)**
Hungary	1.1 (2.2%)*	2.3	2.2	2.0	1.9 (8.0%)*
Poland	0.8 (1.6%)*	4.5	4.9	6.4	7.5 (1.0%)*
China	11.7 (23.0%)*	40.2	44.2	43.8	40.4 (19.0%)*
India	0.5 (1.0%)*	2.4	3.6	2.6	2.2 (1.0%)*
Brazil	1.8 (3.6%)*	10.5	18.7	28.5	31.4 (15.0%)*

* Percentage of total developing and transition countries' flows
Source: UNCTAD (2000)

Table 2: Global Gross FDI Flows: Outward
(billions of dollars and percentages)

	1985-95 annual average	1996	1997	1998	1999
World	203.1 (100%)	390.8	471.9	687.1	799.9 (100%)
Developed Countries	182.5 (90%)	332.0	404.2	651.9	731.8 (92%)
Developing & Transition Countries	20.5 (10%)	57.8	64.3	33.0	65.6 (8%)
CEE and CIS	0.1 (0.5%)*	1.1	3.4	2.2	2.5 (3.8%)*
Russia	0.06 (0.3%)*	0.8	2.6	1.0	2.1 (3.2%)*
Hungary	0.01 (0%)*	-0.003	0.4	0.5	0.3 (0.5%)*
Poland	0.02 (0.1%)*	0.05	0.05	0.3	0.2 (0.3%)*
China	1.6 (7.6%)*	2.1	2.6	2.6	2.5 (3.8%)*
India	0.02 (0.1%)*	0.24	0.11	0.05	0.17 (0.3%)*
Brazil	0.48 (2.3%)*	0.52	1.67	2.61	1.4 (2.1%)*

* Percentage of total developing and transition countries' flows
Source: UNCTAD (2000)

Table 3 indicates that with respect to the gross *inward stock* of FDI, between 1985 and 1999 the global share accounted for by developing and transition countries increased from 29 percent to 31 percent and there was a corresponding decrease in the share held by developed countries. For the CEE and CIS, the stock of inward FDI rose rapidly through the 1990s, and their share of the total for developing and transition countries increased by a factor of 10. Consistent with the data on inflows, Russia's gross stock of inward FDI has increased since the start of its transition (particularly in 1998, reflecting the rise in inflows during 1997), but by end-1999, Russia accounted for approximately 1 percent of the total inward stock for developing and transition economies.

The pattern of the gross *outward stocks* of FDI, as shown in Table 4, indicates an increase in the global share for developing and transition economies since the mid-1980s. The increase for the CEE and CIS has been substantial over the period, particularly due to Russia's outward stock of FDI, which totaled more than US$ 8.5 billion in 1999.

Table 3: Global Gross FDI Stocks: Inward
(billions of dollars and percentages)

	1985	1990	1995	1998	1999
World	763.4 (100%)	1,761.2	2,743.4	4,015.3	4,772.0 (100%)
Developed Countries	545.2 (71%)	1,380.8	1,967.5	2,690.1	3,230.8 (68%)
Developing & Transition Countries	218.1 (29%)	377.4	739.5	1,241.0	1,438.5 (31%)
CEE and CIS	-	3.0 (0.8%)*	40.4	97.6	119.0 (8.3%)*
Russia	-	-	*5.5*	*14.2*	*16.5 (1.1%)**
Hungary	-	0.6 (0.2%)*	10.0	15.9	19.1 (1.3%)*
Poland	-	0.1 (0%)*	7.8	22.5	30.0 (2.1%)*
China	10.5	24.8 (6.6%)*	137.4	265.6	306.0 (21.3%)*
India	1.1	1.6 (0.4%)*	5.6	14.2	16.4 (1.1%)*
Brazil	25.7	37.1 (10%)*	42.5	132.7	164.1 (11.4%)*

* Percentage of total developing and transition countries' stocks
Source: UNCTAD (2000)

Table 4: Global FDI Stocks: Outward
(billions of dollars and percentages)

	1985	1990	1995	1998	1999
World	707.1 (100%)	1,716.4	2,870.6	4,065.8	4,759.3 (100%)
Developed Countries	674.7 (95%)	1,634.1	2,607.1	3,650.0	4,277.0 (90%)
Developing & Transition Countries	32.4 (5%)	81.9	258.3	403.9	468.7 (10%)
CEE and CIS	0.025	0.4 (0.5%)*	5.3	11.9	13.6 (3%)*
Russia	-	-	*3.01*	*7.38*	*8.6 (1.8%)**
Hungary	-	0.2 (0.2%)*	0.383	1.10	1.6 (0.3%)*
Poland	0.03	0.1 (0.1%)*	0.539	1.165	1.4 (0.2%)*
China	0.1	2.5 (3%)*	15.8	23.1	25.6 (5.5%)*
India	0.2	0.3 (0.4%)*	0.5	0.9	1.1 (0.2%)*
Brazil	1.4	2.4 (2.9%)*	5.9	10.7	12.1 (2.6%)*

* Percentage of total developing and transition countries' stocks.
Source: UNCTAD (2000)

Trends and Distribution of FDI Within Russia[10]

Our focus in this paper is the inter-regional pattern of inward FDI. Table 5 presents disaggregated data on annual net FDI inflows for each of the 89 regions for 1995-1999. These data indicate clearly there is significant variation in terms of absolute levels of FDI inflows across Russia's regions.

[10] The data on regional flows and stocks of FDI within Russia are from Goskomstat, which is the only source of inter-regional data on FDI in Russia. As noted above, Goskomstat FDI data differ from those from the CBR and UNCTAD.

Table 5: Russian Net FDI Inflows by Region
(thousands of dollars)

	FDI 1995	FDI 1996	FDI 1997	FDI 1998	FDI 1999
Northern Region					
Karelia Republic	16017	2301	3659	5137	4532
Komi Republic	4751	22242	7524	22796	41109
Arkhangelsk Oblast	3142	3940	14941	10489	400
Vologda Oblast	3564	9304	10007	922	5613
Murmansk Oblast	2776	2550	2331	2188	8153
North-Western Region					
St Petersburg city	145643	113026	149370	259866	272014
Leningrad Oblast	20484	43692	75599	90568	236169
Novgorod Oblast	19268	5922	11270	7584	32702
Pskov Oblast	609	8462	1011	1870	1544
Central Region					
Bryansk Oblast	4409	3716	1821	81	1383
Vladimir Oblast	6366	11334	14769	39177	38527
Ivanovo Oblast	764	0	4653	120	361
Kaluga Oblast	880	1072	674	65181	92102
Kostroma Oblast	21	460	30	1874	1490
Moscow city	1024173	1031888	4117916	803255	787590
Moscow Oblast	206117	413001	72112	637083	390022
Oryol Oblast	18301	19764	39662	33043	16936
Ryazan Oblast	2553	1046	10581	4094	1340
Smolensk Oblast	3214	4043	683	157	75
Tver Oblast	188	217	285	4414	1953
Tula Oblast	1157	20780	34918	29905	5735
Yaroslavl Oblast	529	3764	12132	5949	4631
Volgo-Viatskiy Region					
Mari-El Republic	739	1378	17	.	.
Mordovia Republic	2130	274	1690	4284	604
Chuvash Republic	1102	89	1560	1810	2157
Kirov Oblast	895	593	827	64	5
Nizhny Novgorod Oblast	10421	101238	20814	3958	13801
Tsentralno-Chernozemny Region					
Belgorod Oblast	136	173	270	4649	8390
Voronezh Oblast	1026	18216	812	1941	16510
Kursk Oblast	765	1766	1294	13452	10685
Lipetsk Oblast	3019	5670	523	6396	12150
Tambov Oblast	.	6	83	67	3357
Povolzhkiy Region					
Kalmyk Republic	1641	.	.	.	.
Tatarstan Republic	65084	18800	21526	2649	4316
Astrakhan Oblast	207	1250	853	6261	12136
Volgograd Oblast	17765	21796	30864	76028	53061
Penza Oblast	1191	322	2683	2287	253
Samara Oblast	44745	29594	68210	185857	76322
Saratov Oblast	27265	7642	14331	4950	3099
Ulyanovsk Oblast	266	104	2364	10	280
Adygeya Republic	.	48	25	648	947
Dagestan Republic	56	62	8398	53	.
Ingushetiya	.	.	.	.	.
Kabardino-Balkar Republic	2476	285	254	450	.
Karachaevo-Cherkess Republic	.	30	78	3069	.
Northern Ossetia & Alaniya	.	.		.	.

Chechnya	.	.	.	.	.
Krasnodar Krai	18146	22566	15032	153082	495551
Stavropol Krai	20882	23719	36139	11810	4468
Rostov Oblast	160	24168	13558	2639	12352
Ural Region					
Bashkortostan Republic	3850	6329	8050	5624	12480
Udmurtia Republic	5883	1688	7073	1684	278
Kurgan Oblast	29	89	4	910	1
Orenburg Oblast	694	2028	421	74866	5646
Perm Oblast	15635	33113	7595	4282	22350
Komi-Permyatskiy Autonomous Okrug	.	.	.	.	.
Sverdlovsk Oblast	801	12639	68438	118904	79191
Chelyabinsk Oblast	24355	8445	26684	51315	90572
Western-Siberia Region					
Altai Republic	5	.	.	.	.
Altai Krai	29336	45231	19129	5976	8436
Kemerovo Oblast	1897	780	1935	222	2406
Novosibirsk Oblast	10201	20791	50713	159130	130978
Omsk Oblast	2498	254	3320	12122	1495
Tomsk Oblast	16455	2975	768	17	1720
Tyumen Oblast	32613	30423	65369	90685	107299
Eastern-Siberian Region					
Buryat Republic	997	144	214	2067	72
Tyva Republic	.	.	.	2015	.
Khakasia Republic	1300	229	.	.	0
Krasnoyarsk Krai	2054	678	33491	7638	5571
Taymyrskiy Autonomous Okrug	.	.	.	.	.
Evenkiyskiy Autonomous Okrug	.	.	.	.	.
Irkutsk Oblast	19840	6976	5480	51923	15550
Ust'-Ordynskiy Buryatskiy Autonomous Okrug	.	.	.	.	2
Chita Oblast	174	634	241	27	28
Aginskiy Buryatskiy Autonomous Okrug	.	15	.	.	.
Far-Eastern Region					
Sakha Republic (Yakutia)	5243	7839	9798	871	438
Jewish Autonomous Oblast	31	342	452	.	50
Chukotka	.	.	.	.	.
Primorskii Krai	23172	65460	60924	46084	19867
Khabarovsk Krai	33254	77851	11606	14819	24734
Amur Oblast	924	1025	318	414	2260
Kamchatka Oblast	836	1848	1921	7181	42
Magadan Oblast	19785	45231	61630	48690	26948
Sakhalin Oblast	49619	42900	49046	131925	1022384
Kaliningrad Oblast	12703	21504	10630	9210	4089
RUSSIA	2045677	2467113	5357734	3422470	4335405

Source: Goskomstat

To put these absolute levels in a more economically meaningful perspective, Table 6 shows the regional FDI inflows data cumulated over the 1995-99 period, the share of the national total of cumulative FDI inflows accounted for by each region, and scalar variables, such as regional FDI inflows per capita, regional FDI inflows per square kilometer, and gross regional product (regional levels and shares of national total). The table shows that of total cumulative FDI inflows to Russia over the 1995-99 period, 62% went to just four regions, all of which are in the western portion of the country—Moscow City/Moscow Oblast (54%) and St. Petersburg City/Leningrad Oblast (8%). Apart from Sakhalin Oblast (7.4%) in the Far East and Krasnodar Krai (4%) in the South, no other region in Russia accounts for

Table 6: Russian Cumulative FDI and Scalar Dimensions by Region

	Cumulative FDI Inflows, 1995-99 ('000 US dollars)	Share of Total Cumulative FDI, 1995-99 (%)	FDI Inflows per Capita, 1999 (US dollars)	FDI Inflows per 1000 Sq Km, 1999 ('000 US dollars)	Gross Regional Product, 1997 (bil. Rubles)	GRP Shares, 1997 (%)
Northern Region						
Karelia Republic	31646	0.2%	5870466	183.56	10067	0.4%
Komi Republic	98422	0.6%	35778068	236.65	27177	1.2%
Arkhangelsk Oblast	32912	0.2%	270453	56.03	19245	0.8%
Vologda Oblast	29410	0.2%	4210803	201.85	20803	0.9%
Murmansk Oblast	17998	0.1%	8153000	124.21	19018	0.8%
North-Western Region						
St Petersburg city	939919	5.3%	57532572	--	75784	3.3%
Leningrad Oblast	466512	2.7%	140493159	16372.89	19456	0.8%
Novgorod Oblast	76746	0.4%	44432065	1387.81	7729	0.3%
Pskov Oblast	13496	0.1%	1901478	244.05	6956	0.3%
Central Region						
Bryansk Oblast	11410	0.1%	949863	326.93	12337	0.5%
Vladimir Oblast	110173	0.6%	23738139	3799.07	15265	0.7%
Ivanovo Oblast	5898	0.0%	292071	270.55	8847	0.4%
Kaluga Oblast	159909	0.9%	84497248	5348.13	10919	0.5%
Kostroma Oblast	3875	0.0%	1878941	64.48	8835	0.4%
Moscow city	7764822	44.2%	91261877	---	320085	13.8%
Moscow Oblast	1718335	9.8%	59572629	201769.30	97420	4.2%
Oryol Oblast	127706	0.7%	18734513	5170.28	8890	0.4%
Ryazan Oblast	19614	0.1%	1033951	495.30	14405	0.6%
Smolensk Oblast	8172	0.0%	65331	164.10	12030	0.5%
Tver Oblast	7057	0.0%	1204812	83.91	16213	0.7%
Tula Oblast	92495	0.5%	3241945	3599.03	16577	0.7%
Yaroslavl Oblast	27005	0.2%	3247546	741.90	21093	0.9%
Volgo-Viatskiy Region						
Mari-El Republic	.		.	91.98	6221	0.3%
Mordovia Republic	8982	0.1%	643923	342.82	9331	0.4%
Chuvash Republic	6718	0.0%	1586029	367.10	11574	0.5%
Kirov Oblast	2384	0.0%	3121	19.74	17369	0.8%
Nizhny Novgorod Oblast	150232	0.9%	3748235	1953.60	52944	2.3%
Tsentralno-						
Belgorod Oblast	13618	0.1%	5623324	502.51	18154	0.8%
Voronezh Oblast	38505	0.2%	6670707	734.83	25737	1.1%
Kursk Oblast	27962	0.2%	8051997	938.32	15404	0.7%
Lipetsk Oblast	27758	0.2%	9759036	1151.78	15737	0.7%
Tambov Oblast	.		2618565	102.42	9434	0.4%
Povolzhkiy Region						
Kalmyk Republic	1641	0.0%	.	21.56	1789	0.1%
Tatarstan Republic	112375	0.6%	1141799	1652.57	67160	2.9%
Astrakhan Oblast	20707	0.1%	11828460	469.55	11223	0.5%
Volgograd Oblast	199514	1.1%	19695991	1751.66	32496	1.4%
Penza Oblast	6736	0.0%	164073	155.93	12951	0.6%
Samara Oblast	404728	2.3%	23071947	7550.90	72603	3.1%
Saratov Oblast	57287	0.3%	1138920	571.73	31768	1.4%
Ulyanovsk Oblast	3024	0.0%	189573	81.07	16565	0.7%
Northern Caucasus						
Adygeya Republic	.		2104444	219.47	2554	0.1%

Dagestan Republic	.		.	170.36	9165	0.4%
Ingushetiya	.		.	0.00	956	0.0%
Kabardino-Balkar Republic	.		.	277.20	5441	0.2%
Karachaevo-Cherkess Republic	.		.	225.32	2748	0.1%
Northern Ossetia & Alaniya	.		.	0.00	3406	0.1%
Chechnya	.		.	.	.	
Krasnodar Krai	704377	4.0%	97741815	9268.12	48950	2.1%
Stavropol Krai	97018	0.6%	1661584	1458.92	25679	1.1%
Rostov Oblast	52877	0.3%	2817518	524.57	35062	1.5%
Ural Region						
Bashkortostan Republic	36333	0.2%	3031333	253.02	64557	2.8%
Udmurtia Republic	16606	0.1%	169927	394.44	22114	1.0%
Kurgan Oblast	1033	0.0%	907	14.55	9088	0.4%
Orenburg Oblast	83655	0.5%	2532974	674.64	30594	1.3%
Perm Oblast	82975	0.5%	7502518	516.66	51531	2.2%
Komi-Permyatskiy	.		.	*0.00*	.	
Sverdlovsk Oblast	279973	1.6%	17063348	1437.23	73923	3.2%
Chelyabinsk Oblast	201371	1.1%	24585233	2290.91	51467	2.2%
Western-Siberia Region						
Altai Republic	.		.	0.05	1477	0.1%
Altai Krai	108108	0.6%	3166667	639.31	22052	1.0%
Kemerovo Oblast	7240	0.0%	799867	75.81	48779	2.1%
Novosibirsk Oblast	371813	2.1%	47593750	2086.49	39073	1.7%
Omsk Oblast	19689	0.1%	686410	140.94	33787	1.5%
Tomsk Oblast	21935	0.1%	1604478	69.22	21300	0.9%
Tyumen Oblast	326389	1.9%	33260694	227.42	209198	9.0%
Eastern-Siberian Region						
Buryat Republic	3494	0.0%	69164	9.95	11541	0.5%
Tyva Republic	.		.	11.82	1804	0.1%
Khakasia Republic	.		*0*	*24.70*	*8032*	*0.3%*
Krasnoyarsk Krai	49432	0.3%	1818805	21.13	65482	2.8%
Taymyrskiy Autonomous	.		.	0.00	.	
Evenkiyskiy Autonomous	.		.	0.00	.	
Irkutsk Oblast	99769	0.6%	5625904	129.92	56083	2.4%
Ust'-Ordynskiy Buryatskiy	.		13889	0.09	.	
Chita Oblast	1104	0.0%	22065	2.56	12738	0.6%
Aginskiy Buryatskiy Aut.	.		.	0.79	.	
Far-Eastern Region						
Sakha Republic (Yakutia)	24189	0.1%	443320	7.79	29960	1.3%
Jewish Autonomous Oblast	.		246305	24.31	1300	0.1%
Chukotka	.		.	0.00	2389	0.1%
Primorskii Krai	215507	1.2%	9042786	1299.02	30546	1.3%
Khabarovsk Krai	162264	0.9%	16123859	205.76	31381	1.4%
Amur Oblast	4941	0.0%	2226601	13.59	15665	0.7%
Kamchatka Oblast	11828	0.1%	107692	25.04	8146	0.4%
Magadan Oblast	202284	1.2%	112283333	438.41	6402	0.3%
Sakhalin Oblast	1295874	7.4%	1681552632	14878.00	13369	0.6%
Kaliningrad Oblast	58136	0.3%	4299685	3850.07	8466	0.4%
RUSSIA	17617399	100%			2313816	100.0%

Source: Goskomstat

more than 2.5% of the country's total cumulative inflows. Yet these four regions taken together account for only 22% of the gross national product of Russia (Table 6) and only 13% of Russia's population.

Moscow City and Moscow Oblast in particular are the major hosts for FDI in Russia. In 1995 these two regions combined accounted for 59% of total inflows, and in 1997 their combined share

increased, accounting for 78% of total inflows (Table 5). While in 1998 and 1999 their combined shares dropped significantly to 41% and 28%, respectively—owing to the major oil investment made in Sakhalin Oblast and thus producing some evening out of the regional pattern of FDI inflows on an annual basis—the two regions combined still account for the largest national shares. [11]

It is thus apparent that within Russia there is a strikingly skewed distribution of FDI inflows across the regions. We now turn to analyzing empirically why this is the case.

III. Towards a Model of the Determinants of FDI Within Russia

Hypothesis Development

A large volume of theoretical and empirical literature is devoted to the determinants of the spatial distribution of FDI—but usually in the *inter-country* context. In summary, the theories include, among other approaches, the early Hechsher-Ohlin model and trade models, which emphasize FDI emanating from differentials in the endowments of capital and labor between countries and FDI as a response to overcome barriers to imports;[12] the product life cycle model, which regards FDI as a way of firms to capture remaining profits by expanding overseas to yet un-penetrated markets;[13] and the industrial organization theory of FDI, which focuses on FDI as the natural outcome of international oligopolistic rivalry, including a follow-the-leader type of game.[14]

In the main, building on these theoretical paradigms, the empirical studies, using either cross-country regression analysis or interviews of foreign investors among host countries, generally show that various economic development characteristics—such as market size, labor costs, access to raw materials and infrastructure development—are the major inter-country determinants of FDI.[15] Empirical work focusing on Central and Eastern Europe provides similar results, suggesting that even during the transition process the most important determinants of foreign direct investment are (i) market size, (ii) access to domestic markets, (iii) low costs of production and raw materials and (iv) infrastructure development. An additional key factor seemingly important for these countries is the existence of special economic incentives.

Relatively less attention has been given to exploring *intra-country* determinants of FDI and to the importance of geography and locational elements; the state of institutional development and structural policy reforms; and political economy factors.[16] Our basic thesis is that these latter factors are likely to be as important as the aforementioned economic variables to explain cross-regional differences in FDI, especially within economies that are undergoing major transitions from central planning and exhibiting nascent market institutions like Russia.

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[11] See Table 5 and Bradshaw (2000).

[12] Markusen (1995).

[13] Vernon (1966).

[14] Knickerbocker (1973).

[15] Caves (1989).

[16] An exception is Manaenkov (2000).

The Dependent Variable

The dependent variable employed in our model is the net inflows of FDI in each region at year-end for the years 1995 to 1999, as calculated by Goskomstat. In some cases we cumulate these flows across the five years, and in other cases we test the model on an annual basis.

The Explanatory Variables

Building on the literature we posit that four broad factors are likely to influence the distribution of FDI flows across Russia's regions, as described by the following general equation:

$$FDI = f(\textit{ECONOMIC CHARACTERISTICS, PHYSICAL INFRASTRUCTURE DEVELOPMENT, POLICY FRAMEWORK, STATE OF CIVIC SOCIETY AND INSTITUTIONAL DEVELOPMENT}) \quad (1)$$

Equation (1) suggests that the FDI distribution across regions is a function of economic conditions, policy framework, physical infrastructure and institutional development. But how can we proxy for these broadly defined factors? Next, we introduce four sets of variables that attempt to measure these factors so as to capture the differences existing across Russia's regions.

Economic Characteristics: The economic condition of a region is certainly a key factor in the eyes of potential investors. Within the broad concept of "economic characteristics", we specify three variables to capture different dimensions of the economic conditions of a region that may create significantly different incentives for potential investors across regions: (i) market size; (ii) the costs of productive inputs; and (iii) the quality of productive inputs.

Foreign investors, who seek to sell as well as produce in a market, are interested, first and foremost, in the economic potential of the targeted region. The level of a region's Gross Regional Product (the regional analog of Gross Domestic Product) clearly captures this potential. In particular, the higher the Gross Regional Product, the greater the potential domestic demand, and, thus, the more attractive a region should be to potential investors. For our analysis we use the Gross Regional Product (GRP) as calculated by the Russian regional branches of Goskomstat.

Potential market size is however only one side of the economic dimension story. In their decision whether or not to invest (and how much to invest), foreign investors are also influenced by both the level of costs and by the quality of the inputs to be found in the targeted region. Among the more important inputs generally specific to a region is labor. Both the cost and quality of labor may play a key role in affecting the decision to invest. Regions where, for example, wages are higher, or the labor force is less skilled, should find it more difficult to compete with other regions in attracting foreign investment. These factors are likely to be especially important in the study of Russia, since the regional variation of wage rates and human capital is significant.[17] We therefore include in our analysis the average annual wage of workers (WAGE) and the average schooling rate (EDUCATION),[18] as reported by enterprises to the regional statistical agencies.

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[17] See Table 7.

[18] Defined as the percent of persons that have completed a higher education degree per 100,000 persons.

Physical Infrastructure: Economic conditions are not the only factors considered by potential investors. The infrastructure development of a region is also important, since it indicates how difficult and costly it may be to access suppliers and distribute to markets. The more developed, for example, the road system in a region, the easier the access to markets and the lower the transportation costs, and, thus, the greater the incentive to invest in that region. This intuitive relationship is however difficult to measure since physical infrastructure is actually multi-dimensional—from roads to "telecoms" to railways to waterways and so on. In part because of the difficulty to capture the many aspects of infrastructure development, and in part because of the limited data available, we choose to include in our models the length of paved road, normalized by size of region, (ROAD) as a measure of transportation route density, as reported in Goskomstat's *Regional Statistical Handbook.*[19] We expect the existence of a positive relation between this variable and FDI flows.

Policy Framework: The third factor we believe may play an important role in explaining the differential in regional flows of FDI is the local policy framework governing foreign economic activity. In particular, policies introduced by a regional administration in Russia affecting foreign economic activity can take the form of certain economic incentives or disincentives, for example, in terms of prices charged by regulated utilities; tax rates; customs clearance; registration, licensing and inspection procedures; anti-trust enforcement; access to financial services for handling of foreign exchange and/or credit; among other policies, that may be different from those found in other regions. Of course, these policies take many forms and change often over time, making them difficult to quantify and measure their impact.[20]

To try to overcome this obstacle, we use two variables. The first is a regional multi-dimensional rating index calculated by *Ekspert* magazine, a renown Russian-language periodical (akin to *Business Week)* geared to native Russian investors, founded in early 1995. The index ranks each Russian region on the basis of its perceived business environment (INVESTMENT RATING).[21] Intuitively, we expect FDI to be greater in regions that exhibit a higher rating.[22] However, interpreting the estimated coefficient of

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[19] We also attempted to use a measure of the density of Rail Lines, which proved not significant (see Appendix 1).

[20] In addition, proxies for policy measures are very likely to be closely correlated with the economic status of a region, introducing into our estimation significant multicollinearity problems.

[21] The index, which has been calculated since 1996, uses local statistical information to create an index that is a weighted average of eight dimensions of a region's business environment: (1) natural resource indicator; (2) productive activity indicator; (3) innovation and science indicator; (4) institutional indicator; (5) financial indicator; (6) consumer indicator; (7) labor resource and education indicator; and (8) infrastructure and geographical indicator. Unfortunately, the disaggregated components of the index are not available. We use the log of the inverse of the *Ekspert* index and thus expect a positive statistical relationship between this variable and FDI.

[22] Another way to measure the role of policies on FDI flows is to capture the political stance of each region. Regions characterized by a progressive group of politicians are more likely to attract FDI than other regions. In addition, if foreign investors perceive the political situation in a region to be unstable, they might prefer to make their investment elsewhere to avoid the risk of a loss. To capture these political dimensions, we constructed variables based on the 1996 and 1999 Presidential elections and on the 1995 and 1997 Regional elections: (i) Yavlinsky, that measures the percent of votes obtained by the Presidential candidate Yavlinsky in 1996; (ii) Zyuganov, that measures the percent of votes obtained by Zuyganov in 1996; (iii) Communist 1995 and Communist 1997, that measure, respectively, the votes obtained by the Communist Party in the 1995 and 1997 regional elections. These variables, though intuitively appealing, are not included in our model since they are not significantly correlated with FDI nor statistically significant in our regressions.

an ordinal, ranking variable is difficult and not always meaningful.[23] In addition, INVESTMENT RATING, because of its construction, is highly correlated with other explanatory variables included in our specification, introducing multicollinearity problems. Although we try INVESTMENT RATING despite these concerns, we settle on using it as an interactive variable, a specification we find much more meaningful (see below).[24]

The second variable related to the policy environment for foreign economic activity is the extent of a region's openness to foreign trade. As noted above, there is usually an important linkage between trade and FDI flows. Whether however these two variables are complements or substitutes is not clear *a priori*. On the one hand, greater openness to trade may translate into less FDI if imports (or even possibly exports) are substitutes for direct investment. On the other hand, trade and FDI may be complements in the sense that a region that already is heavily engaged in trade with foreign countries may appear, in the eyes of potential foreign investors, less risky and thus more attractive. We, therefore, construct an index that captures openness to foreign trade based on the regional flow of imports and exports, for 1997, defined as:

$$\text{TRADE} = (\text{Imports} + \text{Exports}) / \text{GRP}.^{25}$$

Civic Society and Institutional Development: The state of institutions and the "quality" of civic society are likely to be important factors that influence foreign investors' decisions, especially in transition and developing economies. For example, regions with a strong institutional fabric, characterized by adherence to rules-based decision-making, pursuit of due process, and high participation by the population in civic activities may signal an inviting business environment. In contrast, regions characterized by widespread government interference in the marketplace, extensive use of discretion in application of economic policies, corruption and crime are perceived by investors as riskier environments in which to do business.

One obvious type of variable to be included as a measure of institutional development in these regards would be an indicator of the strength of the legal institutions in place across Russia's regions, such as the quality of a region's legal framework and/or judicial institutions and so on. Unfortunately, good data on these facets of institutions are not systematically available at the regional level in Russia.[26] We had to settle on using the following two variables to capture strength of civic society and institutional

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[23] See for example Wooldridge (2000), Chapter 7, for a discussion on the use and interpretation of ordinal variables.

[24] When INVESTMENT RATING is used without the interaction, its coefficient displays the incorrect sign and is statistically significant; in large part this perverse result is due to the high degree of collinearity of INVESTMENT RATING with many of the other variables (see Appendix 1). This is not surprising given the overlap with some of the other variables and some of the components that comprise this rating index. Data availability problems do not allow use of the disaggregated ratings described in footnote 21, instead of the aggregate one.

[25] Using Goskomstat Trade statistics.

[26] We attempted to use rough proxies along these lines, but with very poor results. We constructed, for example, an index of the quality of the legal framework using data on the maximum number of staffing for judicial bailiffs for each region. Since these data do not indicate the *actual* level of bailiffs employed, we decided not to use them. We also tried to use the number of staff employed in the regional branches of the Ministry for Anti-Monopoly Policy and Support for Entrepreneurship. However, this variable was not significant.

development: (i) the crime rate in each region per 1000 person population (CRIME)[27] and (ii) the voter participation rate in the 1996 Presidential election for each region (PARTICIPATION). Our expectation is that the higher the crime rate – calculated as the number of reported crimes in a given year per 100,000 persons—the poorer the state of institutional development and, thus, the less attractive is the region for investors. Similarly, the lower the voter participation rate, the weaker the civic fabric of a region, and thus the smaller the incentive to invest.

At this juncture, the first approximation of our basic model is the following:

$$FDI = f(GRP, WAGE, EDUCATION, ROAD, OPENNESS\ TO\ TRADE, INVESTMENT\ RATING, CRIME, PARTICIPATION) \quad (2)$$

However, we believe that there may be other variables missing from this empirical specification that are likely to affect foreign investors' decisions. "Complementarity effects", based on the notion that a region's attractiveness to foreign investors is driven by the region's attractiveness to *domestic* investors (and/or previous foreign investors), may play an important role. The geographical features of a region constitute another set of potentially important variables in explaining intra-country patterns of FDI flows, as recent studies suggest.[28] The underlying stability of the social fabric of a region may also affect foreign investors' location decisions.

Complementarity Effects. The performance effects of the presence of foreign investors and domestic investors within a market has long been studied in the literature. Within Russia, these effects are only recently being explored.[29] Our main hypothesis in this respect is that in a complex business environment like Russia, where FDI remains overall quite low (and thus foreigners do not yet have significant experience investing in Russia), the presence of significant domestic private investment in a region may well serve as a catalyst for FDI flows to that region: all other things equal, regions that exhibit a high level of private domestic investment send a positive signal to foreign investors about quality of the economic and institutional environment of these regions. Thus, we should observe higher FDI flows associated with greater amounts of domestic private investment. A similar argument can be made regarding lagged FDI. High levels of FDI in the past may signal to potential current foreign investors the soundness and potential of a regional economy. We therefore include among our explanatory variables (i) DOMESTIC PRIVATE INVESTMENT by region, derived from Goskomstat's *Regional Handbooks*, for 1995 to 1998,[30] and (ii) LAGGED FDI.

To overcome the problems mentioned above with INVESTMENT RATING and still capture the effects of a region's policy framework on FDI flows, we choose to include in our model INVESTMENT RATING as an interaction term with DOMESTIC PRIVATE INVESTMENT. Domestic investment decisions are based on *outcomes* of regional business policies. This interaction term, therefore, measures both *perceived* and *actual* outcomes of the business policy environment in each region, combining the standpoint of a region's business environment in terms of how well that region is *perceived* by domestic businessmen in a ranking compared to other regions, and the extent to which domestic investors in fact act on that perception and actually *make* investments.

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[27] Goskomstat *Regional Handbook*

[28] See, for example, Broadman and Sun (1997) on China.

[29] See, for example, Yudaeva (2000).

[30] We also include Domestic Private Investment as a lagged variable, since that is consistent with our hypothesis.

Geography. Russia is a very large country—spanning 11 time zones—and its regions (understandably) thus differ greatly in terms of geographical characteristics, for example, harshness of climate, access to the sea, and mountainous areas. Increasingly geographers and others are focusing on the effects of such features on the location of industry within Russia, perhaps with greatest attention recently being devoted to the locational effects of different climatic conditions.[31] To test the effects of these geographic features, we include among our explanatory variables a set of dummies:[32]

(i) CLIMATE, a dummy variable that classifies Russian regions on the basis of the harshness of climate; this variable takes on a value of 1 for regions with a milder climate, and zero otherwise;

(ii) COAST, a dummy variable that reflects coastal location and takes a value of 1 if the region has access to the sea; zero otherwise;

(iii) URALS, a dummy variable that separates regions between those located west of the Ural Mountains and those located east of the Urals; it takes a value of 1 for regions located on the East of the Urals, and zero otherwise;

(iv) PORT, a dummy variable that reflects access to sea trade and takes value of 1 if a major port is located within the oblast, and zero otherwise.

Social Stability. In cross-country studies of FDI, nations characterized by social unrest are less attractive in the eyes of foreign investors because of the possibility of violence and other outcomes of social conflicts. Russia is a country with a rich composition of ethnic groups. Following the literature, which approximates the propensity for social unrest by looking at the ethnic composition of populations, we use Goskomstat data to calculate the percent of ethnic Russians living in each region (RUSSIAN). The intuition is that the more ethnically fragmented a region is, the more likely the possibility of social friction and thus the lower the level of FDI, all other things equal.

Finally, we introduce a variable due to the preponderance of FDI flows going to Moscow City and Moscow Oblast. That these two jurisdictions are outliers can be explained by several factors. First, recorded FDI may be higher because Moscow was in the early- to mid-1990s the *de facto* point of entry for all FDI into Russia because the bureaucracy explicitly or implicitly required all foreign activities to flow through the capital area. Foreign investors also may have perceived the institutional environment to be more reliable in Moscow than in other regions during the early years of the transition. Finally, foreign investors probably had initially better access to information about potential markets in Moscow. To control for these factors, we introduce MOSCOW, which measures the distance in kilometers from the capital.[33]

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[31] See, for example, Gaddy and Ickes (2001).

[32] We also tried a measure to portray Oil Development in each region; it was not significant (see Appendix 1).

[33] In addition to introducing the variable MOSCOW, we also estimate our model excluding (i) Moscow and (ii) both Moscow and St. Petersburg from the sample. The results are presented in Appendix 2.

Because of the above considerations, we estimate variations of both equation (2) and equation (2'), which includes our expanded list of variables:

FDI = f (GRP, WAGE, EDUCATION, ROAD, TRADE, INVESTMENT RATING X DOMESTIC INVESTMENT, *CRIME, VOTER PARTICIPATION, DOMESTIC INVESTMENT, LAGGED FDI, CLIMATE, URALS, COAST, PORT, RUSSIAN, MOSCOW)* *(2')*

IV. Empirical Results

Descriptive Statistics and Bivariate Correlations

Tables 7 and 8 summarize the basic statistics of what turn out to be the "core" explanatory variables in equation (2') and the bivariate correlations between them.[34] A quick examination of Table 7 suggests that five of these explanatory variables—GRP, EDUCATION, TRADE, WAGE, DOMESTIC INVESTMENT—differ greatly among the regions, while the remaining variables—VOTER PARTICIPATION, ROAD, INVESTMENT RATING and CRIME—display lesser degrees of regional variability. The simple correlation analysis in Table 8 suggests that the following variables are the most significantly correlated with all measures of FDI used: GRP, EDUCATION, TRADE, DOMESTIC PRIVATE INVESTMENT AND INVESTMENT RATING.

Table 7: The "Core" Explanatory Variables

Variable	Basic Statistics			
	Mean	Std. Dev.	Minimum	Maximum
Wage ('000 rubles)	1010.8	638.3	364.5	3660.1
GRP ('000 rubles)	30768.3	53330.5	956.0	417505
Education	5129.1	6587.0	275.0	44660.5
Crime	1668.7	491.7	366.0	2849.0
Paved Roads (normalized by oblast size)	11.4km	17.1	0.002	149.6
Voter Participation	62.34%	7.63	33.4	76.9
Openness to Trade	0.25	0.58	0.014	5.08
Domestic Private Investment ('000 rubles)	97690	242100	0	1694100
Climate	0.1573	0.3661	0	1
Investment Rating	-3.52	0.92	-4.489	0

[34] For additional correlation analyses—of all of the variables—please see Appendix 1.

TABLE 8 : CORRELATION COEFFICIENTS BETWEEN FDI AND EXPLANATORY VARIABLES

Variable	FDI95	FDI96	FDI97	FDI98	FDI99	FDI(95-97)	FDI(95-98)	FDI(95-99)	FDI(98-99)	FDI(97-99)
Wage (1994-1998)										
GRP (1996-1997)	+	+	+	+	+	+	+	+	+	+
Education (1994-1998)	+	+	+	+	+	+	+	+	+	+
Crime (1994-1998)								- (1998)		
Paved Roads (1997)										
Voter Participation (1996)										
Openness to Trade (1997)	+	+	+	+	+	+	+	+	+	+
Domestic Private Investment (1995-1998)	+	+	+	+	+	+	+	+	+	+
Investment Rating (1996-1998)	N.A.	+	+	+	+	+	+	+	+	+
Lagged FDI	N.A.	+	+	+	+	N.A.	N.A.	N.A.	+	+
Climate										

An empty box indicates that the correlation between the two variables was not statistically significant; a "+" indicates a positive statistically significant correlation; a "-"indicates a negative statistically significant correlation. For variables covering several years we report in parenthesis the year for which the correlation coefficient is significant. If the year is not specified, the correlation is statistically significant for all years included in the sample.
The following variables were not included in the table since their correlation coefficients were never statistically significant:
Oil production, Rail lines, Yavlinsky, Coast, Urals, Port, Russian and Moscow

For additional correlation analysis results, please see Appendix 1.

Econometric Tests

Determinants of Cumulative FDI Flows. We first estimated several variants of equation (2') for cumulative FDI flows over the period 1995-1999. In the main, despite different empirical specifications, much of our initial intuition tends to be supported: economic characteristics (market size), infrastructure development, and policy environment appear to be the most important factors in explaining differences in FDI flows across Russia's regions. Table 9 describes the results of the Generalized Least Squares estimation[35] of equation (2') for the "core" variables. The results of the correspondent estimation procedure for other variants of this model with the additional control variables are not reported, since none of the additional control variables is statistically significant and the qualitative results of Table 9 do not change materially.

Table 9: Determinants of Cumulative FDI in Russia, 1995-1999

Dependent Variable:	FDI95-99
Wage (1995)	-231.35 (-0.40)
GRP (1996)	12.59** (3.62)
Education (1995)	14.07 (0.72)
Crime (1998)	122.76 (0.72)
Paved Roads (1997)	22012.7* (1.73)
Openness to Trade (1997)	62509.4 (0.15)
Climate	283571.8 (0.91)
Participation Rate (1996 Election)	-385.80 (-0.04)
Private Domestic Investment (1995)	3430.04** (3.91)
Investment Rating x Domestic Investment (1996)	580.29** (2.56)
R-square	0.803449
Number of obs.	73

Every regression includes a constant term.
T-statistic for the H0: coefficient=0 in parentheses.
** Significant at the 5%. * significant at the 10%

[35] We use the GLS procedure rather than the basic OLS to correct for possible heteroskedasticity, a common problem in cross sectional data.

The reported coefficient estimates for the model in Table 9 all have the expected sign except CRIME and VOTER PARTICIAPTION. Four of the eight explanatory variables included in the regression explain about 80 percent of the difference in the cumulative flows of FDI across Russian regions between 1995 and 1999. In particular, GRP, ROAD, DOMESTIC INVESTMENT and INVESTMENT RATING interacting with DOMESTIC INVESTMENT are indicated as the most important factors in explaining foreign investors' regional decisions within Russia over the 1995-99 period.

The coefficients on the remaining variables in Table 9 deserve explanation. A region's OPENNESS TO TRADE, which serves as one proxy for the quality of the economic policy framework in the region, does not seem to play a role in explaining differences in regional FDI flows in the model.[36] The bi-variate correlation analysis (Table 8) seems to suggest that FDI may not be a substitute for trade, but rather that capital inflows and foreign trade may complement each other. Although the coefficients on WAGE and EDUCATION display the correct sign, they are not statistically significant. On the other hand, the coefficients on CRIME and VOTER PARTICIPATION do not exhibit the correct sign and are also not statistically significant. The disappointing performance of these four variables can in part be explained by significant collinearity problems, detectable by the strong correlation existing between these and other explanatory variables (see Appendix 1).

As mentioned above, we also estimate other combinations of equation (2'). Though the quality of our results does not change, none of the other control variables is statistically significant. Once more, the most likely culprit for this lack of explanatory power is the high degree of collinearity among the variables, as highlighted by the correlation analysis in Appendix 1. In particular, there is strong correlation between Education, Wage, Domestic Investment, Investment Rating and the other Geography dummies, Lagged FDI and Moscow.[37]

To assess the impact of regional outliers on the robustness of our results, we estimate our "core" model eliminating Moscow and St. Petersburg, from the sample,. As described in Appendix 2, our model significantly loses explanatory power, displaying an R-square of 0.502 and 0.325 for the model eliminating Moscow and Moscow and St. Petersburg, respectively. Our results are robust only to the elimination of Moscow, but not to the elimination of both regions.[38]

To summarize this first-cut analysis, Russian regions that have sizeable market potential, better developed infrastructure, played host to significant domestic private investment, and have more "market-friendly" business environments have attracted greater amounts of FDI over the 1995-1999 period than have other regions in the country.

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[36] We are aware that including "Openness to Trade" (which is calculated for 1997) among the explanatory variables in the cumulative FDI regression for 1995-1999 raises potential endogeneity problems between FDI (1995 and 1996) and "Openness to Trade". To detect the extent of these problems, we examined the correlation coefficients between Openness to Trade and FDI for each single year of the sample. The coefficients are statistically significant for all years and do not exhibit much variation (0.22-0.24). This simple check suggests that our regression results are unlikely to be tainted by endogeneity problems. The use of this "stock" variable for 1997 to explain a flow over 5 years may however be the reason for its poor performance.

[37] For a complete description of the statistical results, see Appendix 2.

[38] This last set of results reinforce our concern about multicollinearity problems among the explanatory variables.

Determinants of Annual FDI Flows. Of course, in Russia the period between 1995 and 1999 was characterized by a series of profound economic changes and dramatic events, first among all, the default, ruble devaluation and economic crisis in August 1998. A key question is whether or not as a result of these events have the regions targeted by foreign investors changed? To better understand how the 1998 crisis may have affected the geographical determinants of FDI, we repeat our empirical exercise, using our "core" model, but concentrating on the *yearly* flow of FDI to each Russian region. The results of these 5 estimation procedures are described in Table 10.

Table 10: Determinants of FDI in Russia – Annual FDI Flows, 1995-1999

Dependent:	FDI1995	FDI1996	FDI1997	FDI1998	FDI1999
Wage (94-98)	-233.37 (-1.46)	-19.19 (-0.19)	-233.9 (-1.23)	13.87 (0.49)	230.41** (3.61)
GRP (96-97)	2.40** (5.12)	2.02** (3.67)	7.73** (4.46)	0.49 (1.40)	-2.47** (-2.78)
Education (94-98)	0.436* (1.65)	2.83 (0.89)	-1.06 (-.10)	5.34** (2.95)	12.20** (2.74)
Crime (94-98)	-3.52 (-.15)	31.65 (1.32)	94.97 (1.25)	6.50 (0.37)	38.23 (0.93)
Paved Roads (1997)	809.42 (1.28)	5860.5** (2.44)	14885.9** (2.04)	33.42 (0.08)	-864.54 (-.85)
Openness to Trade (1997)	46468.6 (0.72)	-6939.6 (-.78)	-186035.23 (-.07)	-5588.8 (-0.11)	-5435.9 (-.05)
Climate	61897.2 (1.36)	72340.9 (1.48)	325439.4** (2.26)	-8881.8 (-.30)	-224218.6** (-3.04)
Voter Participation (1996 Election)	518.18 (0.36)	-482.85 (0.32)	-1982.1 (-0.44)	-248.85 (-0.27)	-653.46 (-.28)
Private Domestic Investment (95-98) (lagged – 2)	--	437.37** (3.19)	1177.0** (2.79)	348.57** (8.01)	235.74** (5.26)
Investment Rating x Domestic Investment (96-98)	--	72.58** (2.04)	194.29* (1.80)	125.31** (6.20)	49.72** (2.08)
R-square	0.734722	0.802075	0.798558	0.931102	0.661237
Number of Obs.	69	69	68	68	68

Every regression includes a constant term.
T-statistic for the H0: coefficient=0 in parentheses.
** Significant at the 5%. * significant at the 10%

We are especially interested in any change of behavior that may have occurred during or after 1998. Not surprisingly, the data highlights the existence of a significant change in the regional pattern of foreign direct investment between 1998 and 1999.

For the early years of our analysis, 1995 through 1997, the model produces results very similar to the ones discussed above: GRP, INFRASTRUCTURE, DOMESTIC INVESMTENT and INVESTMENT RATING (in interaction with DOMESTIC INVESTMENT) are indicated as key determinants of FDI flows on an annual basis. The coefficient on EDUCATION is statistically significant in 1995, and the coefficient on CLIMATE is statistically significant in 1997. The coefficient on WAGE always displays the correct sign (although not statistically significant). TRADE and VOTER PARTICIPATION, as above), do not yield statistically significant results.

In 1998, however, we start to observe the first inconsistencies. The coefficient on GRP becomes insignificant, as does that on ROAD. Although the coefficient on EDUCATION is quite significant, the sign on WAGE is incorrect. The coefficient on CLIMATE while insignificant, displays the incorrect sign. Only the performance of DOMESTIC INVESTMENT and INVESTMENT RATING (in interaction with DOMESTIC INVESTMENT) remains as before.

Although the 1998 results could be attributed to the effects of the crisis, it becomes difficult to explain the 1999 estimate results. It appears that a structural change in the regional determinants of FDI took place. The explanatory power of our model declines from an average of about 82 percent over the previous four years to 66 percent for 1999. While DOMESTIC INVESTMENT, INVESTMENT RATING (in interaction with DOMESTIC INVESTMENT), and EDUCATION are statistically significant, WAGE, GRP and CLIMATE all have the incorrect sign yet are statistically significant. The coefficient on ROAD also displays the incorrect sign.

These findings are robust to alternative specifications of the model and to the inclusion of different control variables. As in the analysis of cumulative FDI flows, none of the other control variables described in (2') is statistically significant.[39] Interestingly enough, not even the inclusion of Lagged FDI in the estimation of FDI1999 produces consistent explanatory power across the 5 years, corroborating even more our claim that a structural change took place following the crisis in 1998.

These results—while still preliminary—suggest that the 1998 default, devaluation and crisis produced a significant impact on foreign investors' perceptions and confidence about regional conditions in the Russian economy. It also suggests that in the aftermath of the crisis, the determinants of the geographic pattern of foreign direct investment took a different route that the earlier model is not able to capture adequately.

The challenge at this stage is to assess the durability of these changes. A starting point is clearly to examine whether the alterations in the determinants of FDI observed in 1999 still appear in 2000.[40] A longer time horizon would facilitate the task of understanding whether 1999 was simply an outlier, or whether the change was indeed "structural", as we suggest. In addition, more disaggregate information on the institutional and economic characteristics of each region, separating the contribution of different

[39] See Appendix 2.

[40] Goskomstat has not released official data for the year 2000. Only preliminary figures are available.

institutions to foreign investors' decisions,[41] would help us assess more clearly the determinants of FDI flows in the new Russian economic environment.

V. Conclusion

In this paper we have attempted to unbundle empirically the determinants of the geographic distribution of FDI within Russia. We have found that market size, infrastructure development, and policy framework factors explain much of the observed variation of FDI flows across Russia's regions. Further, and more interestingly, our results suggest that the model that explains well the cross-regional variation in FDI flows from 1995-1998 changes significantly in terms of explanatory power following the 1998 crisis, suggesting a "structural regime change" in the FDI framework in Russia in the post-crisis period.

While we believe our findings are robust, there are several extensions of our work that should be pursued. First, it would be important to know to what extent our finding of a "structural regime change" in the regional determinants of FDI in Russia since 1998 is transitory or more enduring. To test this hypothesis, a longer time horizon for regional flows of FDI, as well as more current data on the explanatory variables, would be needed.

Second, the data on FDI available from Goskomstat do not allow us to carry out a sectoral analysis of regional FDI flows. These sectoral differences may however be quite important in explaining regional patterns of FDI. In addition, the availability of regional information on industry competitiveness, such as seller concentration and barriers to entry, would enrich our analysis.

Third, and related to the previous point, our unit of analysis has been each Russian region, and thus we measure FDI as the aggregate flow of FDI into each region. Greater precision of our hypothesis tests would be possible—e.g., in assessing the complementarity effects between FDI and domestic investment—if data were available on annual FDI flows by firm, per region. To our knowledge, such firm-level data are not readily available, and would require extensive survey work.

Finally, as we noted in the text, due to data shortcomings, some of our variables may well be mis-specified (for example, "Openness to Trade"). Further, and perhaps more important, our analysis suffers from multi-collinearity problems and potential missing variables, as emphasized above. Clearly, rectifying these problems, by enriching the data set and using alternative measures of regional development, is a priority for further research.

[41] As, for example, the development of financial services.

REFERENCES

Ahrend, R., "Speed of Reform, Initial Conditions, Political Orientation, or What? Explaining Russian Regions' Economic Performance." Mimeo. December 1999.

Ahrend, R., "Foreign Direct Investment Into Russia—Pain Without Gain?" *Russian Economic Trends*, June 2000.

Bergsman, J, Broadman, H. and Drebentsov, V., "Improving Russia's Foreign Direct Investment Policy Regime," in Broadman, H. (ed.) *Russian Trade Policy Reform for WTO Accession,* The World Bank, Washington, DC. 1999.

Bradshaw, M., *Regional Patterns of Foreign Investment in Russia*, Royal Institute of International Affairs, London, 1995.

Bradshaw, M., "Foreign Investment in Russia's Regions," Economist Intelligence Unit, Business Russia, 2000.

Broadman, H. and Sun X., "The Distribution of Foreign Direct Investment in China," *The World Economy,* May, 1997.

Brown, D. and Earle, J., "Competition, Geography and Firm Performance Lessons from Russia," mimeo. Stockholm Institute of Transition Economics, August 2000.

Caves, Richard E. *Multinational Enterprise and Economic Analysis.* Cambridge, MA: Cambridge University Press, 1989.

Foreign Investment Advisory Service (FIAS). *Russia: The Climate for Foreign Direct Investment*, The World Bank, Washington, DC. August, 1992.

Foreign Investment Advisory Council (FIAC). *Barriers to Foreign Investment in Russia.* Government of the Russian Federation, Moscow. 1994.

Foreign Investment in Russia: Trends and Prospects. Imperial, 1995.

Gaddy, C. and Ickes, B., "The Cost of Cold". Presentation at the Harriman Institute, Columbia University, New York,, February 2001.

Knickerbocker, Frederick T. *Oligopolistic Reaction and Multinational Enterprise.* Boston: Harvard University Graduate School of Business Administration, 1973.

J.P. Morgan, Global Data Watch, May 8, 1998.

Manaenkov, D. "What Determines the Region of Location of an FDI Project? An Empirical Assessment", Working Paper BSP/36 E, New Economic School, Moscow, 2000.

Markusen, J. "The Boundaries of Multinational Enterprise and the Theory of International Trade," Journal of Economic Perspectives, 9(2), 1995.

OECD. *The Investment Environment in the Russian Federation: Laws, Policies and Institutions.* CCNM/Russia/IME(2001)3 OECD, Paris. March 2001.

Stern, N. "Globalization and Poverty", Address given at the Institute of Economic and Social Research, University of Indonesia, mimeo, December 2000.

UNCTAD. *Foreign Direct Investment and the Challenge of Development.* World Investment Report-1999. United Nations, Geneva.

Vernon, Raymond. "International Investment and International Trade in the Product Cycle." *Quarterly Journal of Economics* 80 (May 1966).

Wooldridge, Jeffrey (2000), *Introductory Econometrics*, South-Western College Publishing, 2000.

World Bank. *Global Development Finance: Building Coalitions for Effective Development Finance.* World Bank, Washington DC. April 2001.

Yudaeva, K et al, "Does Foreign Ownership Matter? The Russian Experience." Mimeo. New Economic School, Moscow, October 2000.

Appendix 1: Additional Correlation Analysis

Description of additional variables utilized

Economic Characteristics:

- OIL : Production of Oil and Gas Condensate ('000 tons), 1997

Physical Infrastructure Development:

- Rail road per oblast: Operational Rail Lines (km of operational track), end-1997
- Private Automobile Ownership (cars per 100 families), end-1997
- Urban Access to Residential Telephone Service (phones per 100 families), 1997

Policy Framework:

- Percentage of votes cast to the Communist Party in the Election of the State Duma, 1993, 1995, 1999
- Percentage of votes cast to Presidential candidate Zyuganov in 1996 election
- Percentage of votes cast to Presidential candidate Yavlinsky in 1996 election

Geography:

- Coast, dummy variable; takes value 1 if oblast has coastline, zero otherwise
- Urals, dummy variable; takes value 1 if oblast includes Ural mountain, zero otherwise
- Ports, dummy variable; takes value 1 if oblast has major port, zero otherwise
- Moscow: measure distance in KM from Moscow city

TABLE A1.1 : CROSS-CORRELATION BETWEEN EXPANDED LIST OF EXPLANATORY VARIABLES

Variable	Dom. Priv. Invest.	Wage	GRP	Education	Crime	Paved Roads	Voter Participation	Openness to trade	Investment Rating	Zyuganov	Yavlinsky	Communist Party	Moscow	Russian	Oil	Geography dummies
Domestic Priv. Invest. (95-98)			+	+	-	+			-							
Wage			+(95-98)		+(94-96, 98)	-(95, 96, 98)			-(94)	-	+	-(94, 96-98)	+		+	CL, CS, U
GRP				+	+(94)		+		-	-		-(99)				
Education								+(97)	-			-(99)	-	+(96)		
Crime						-		-		-	+	-	+	+	+(94)	-U, +P (94,95, 97)
Paved Roads							-		- (96,97)				-			+(U, CS) -P
Voter Participation								-			-		+			-(U, P), +CL
Openness to Trade										-	+	–				
Investment Rating											-(96)		+	-	-(98)	-U(96), -P, +CL
Zyuganov											-	+	-			-(CL,P, CS) +U
Yavlinsky												-		+		+(CS,P, CL)
Communist Party													-	-(93)	-(95)	-CS (95,99), +U, -CL
Moscow																+(CS, P, CL), -U
Russian																
Oil																-U
Geography Dummies																

An empty box indicates that the correlation between the two variables was not statistically significant; a + instead indicates a positive statistically significant correlation; a - negative one. For variables covering several years we report in parenthesis the year for which the correlation coefficient is significant. If the year is not specified, the correlation is statistically significant for all years included in the sample.
Legend: CL: Climate dummy; CS: Coast dummy; U: Ural dummy; P: Ports dummy

Appendix 2: Additional Regression Results

(I) Eliminating Moscow and St. Petersburg from the sample

Table A2.1: Determinants of Cumulative FDI in Russia, 1995-1999

Dependent:	Dropping Moscow	Dropping Moscow and St. Petersburg
Wage	561.22** (2.80)	457.39** (2.52)
GRP	-2.08 (-1.52)	-0.61 (-0.47)
Education	32.66** (4.84)	6.67 (0.87)
Crime	75.63 (1.29)	72.03 (1.37)
Paved Roads	3685.3 (0.83)	2301.6 (0.57)
Openness to Trade	32106.5 (0.22)	-38832.5 (-0.29)
Climate	-241714.4** (-2.19)	-222196.9** (-2.24)
Voter Participation (1996 Election)	-1569.8 (-0.51)	-1837.7 (-0.66)
Private Domestic Investment (1995)	472.35 (1.43)	608.19** (2.03)
Investment Rating x Domestic Investment	60.26 (0.74)	71.11 (0.97)
R-square	0.501530	0.325390
Number of Obs.	72	71

Every regression includes a constant term.
T-statistic for the H0: coefficient=0 in parentheses.
** Significant at the 5%. * significant at the 10%

(II) Including Lagged FDI

Table A2.4: Determinants of FDI in Russia – FDI Flows, 1995-1999

Dependent:	FDI1996	FDI1997	FDI1998	FDI1999
Wage	8.74 (0.38)	-87.36** (-2.53)	31.59 (1.39)	238.63** (3.62)
GRP	-0.02 (-0.12)	0.94** (2.67)	-0.04 (-.13)	-2.58** (-2.74)
Education	-0.42 (-0.57)	-11.36** (-6.12)	5.38** (3.72)	12.19** (2.66)
Crime	1.97 (0.35)	-18.51 (-1.29)	-1.12 (-0.08)	38.55 (0.89)
Paved Roads (1997)	337.65 (0.58)	-1286.68 (-0.92)	-149.94 (-.45)	-989.82 (-.93)
Openness to Trade (1997)	-14667.9 (-0.71)	-11827.98 (-0.24)	-4102.03 (-0.10)	14441.7 (0.12)
Climate	535.76 (0.05)	55576.7** (2.08)	-26670.7 (-1.11)	-235791.9** (-3.08)
Voter Participation (1996 Election)	178.48 (0.50)	652.43 (0.78)	-360.63 (-0.48)	-941.1 (-.06)
Private Domestic Investment (lagged –2)	47.45 (1.42)	167.58** (2.09)	101.75* (1.87)	228.09 (1.38)
Investment rating x Domestic Investment	10.41 (1.25)	39.22* (1.96)	38.92* (1.79)	45.93 (0.64)
Lagged FDI (–2)	1.16** (32.62)	3.48** (41.22)	0.66** (5.90)	0.02 (0.08)
R-square	0.990506	0.993940	0.957762	0.664885
Number of Obs.	66	65	67	66

Every regression includes a constant term. T-statistic for the H0: coefficient=0 in parentheses. ** Significant at the 5%. * significant at the 10%

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